

# PATENT ABSTRACTS OF JAPAN

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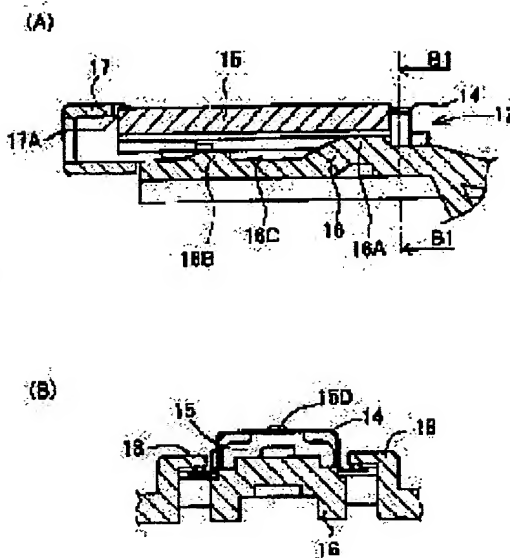
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## (54) PAPER FEEDER

(57)Abstract:

**PROBLEM TO BE SOLVED:** To provide a paper feeder that can always and properly feed paper one by one, while the balance of friction force generated between a lower end of the paper and a paper separating pad, with feeding force of a feed roller is kept well.

**SOLUTION:** In a predetermined area downstream of a skirt portion 15B of the separating pad 15 in a direction of carrying paper, two lower faces 15B1, 15B2 are supported via a pad supporting portion 16A of a pad supporting member 16 disposed to a main body casing 2 to strongly support the separating pad 15 to prevent the separating pad from bending to increase resistance against the paper. In a predetermined area upstream of the skirt portion 15B in the direction of carrying paper, only the lower face 15B2 is supported via a supporting portion 16B of the pad supporting member 16 to support the separating pad 15 weakly compared with the downstream area, so that suitable flexibility is maintained when stacked paper abuts on the elastic separating pad 15.



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CLAIMS

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[Claim(s)]

[Claim 1] the following -- having -- the aforementioned pad supporter material -- the predetermined field of the form conveyance direction downstream of the aforementioned skirt-board section -- receiving -- the -- the feed equipment which has the deleaving member which collaborates with feed operation of a feed roller and separates one sheet of form in case [ each ] paper is fed to the form contained in the state of the laminating by the main part case characterized by supporting a back face-ed [ 2 ] with a feed roller the electrode holder with which a long hole is formed and, as for the aforementioned deleaving member, is arranged along the direction of a laminating of the aforementioned form at a main part case -- a member the aforementioned electrode holder -- the separation pad which has the elasticity in which the lobe by which the soffit of a form is contacted while being arranged at the member bottom and carrying out specified quantity projection from the aforementioned long hole, and the skirt-board section which follows a lobe were prepared the [ from which it is prepared in the aforementioned main part case, and has the pad supporter material which supports the skirt-board section of the aforementioned elastic separation pad from the bottom, and the aforementioned skirt-board section serves as the lowest edge ] -- a back face-ed [ 1 ] the [ the ] -- the [ which is prepared between a back face-ed / 1 / and the aforementioned lobe ] -- a back face-ed [ 2 ]

[Claim 2] the aforementioned pad supporter material -- between the predetermined field of the form conveyance direction downstream of the aforementioned skirt-board section, and the predetermined fields of an upstream -- the [ aforementioned ] -- the feed equipment according to claim 1 characterized by forming the opening which does not support a back face-ed [ 1 ]

[Claim 3] Feed equipment according to claim 1 or 2 characterized by forming minute irregularity in the upper surface of the aforementioned lobe.

[Claim 4] the covering member in which the bending section which counters the form contained by the aforementioned main part case was prepared arranges -- having -- \*\*\*\* -- the aforementioned covering -- the feed equipment according to claim 1 to 3 characterized by regulating the bending section of a member so that a laminating state may be held in contact with a form

[Claim 5] The center of the aforementioned feed roller and the center of the aforementioned elastic separation pad are feed equipment according to claim 1 to 4 characterized by estranging only predetermined distance along the cross direction of the aforementioned form.

[Claim 6] the aforementioned main part case -- the aforementioned deleaving -- form supporter material prepares on both sides of a member -- having -- \*\*\*\* -- the aforementioned deleaving -- the electrode holder of a member -- the feed equipment according to claim 1 to 5 characterized by constituting the apical surface of a member and each form supporter material flat-tapped mutually in the downstream of the feed direction of a form

[Claim 7] Feed equipment according to claim 6 characterized by preparing the ramp which becomes low in \*\*\*\* at each aforementioned form supporter material as it goes to the downstream of the aforementioned feed direction.

[Claim 8] Feed equipment according to claim 1 to 7 characterized by preparing the guidance rib which has the ramp which becomes low in \*\*\*\* near the main part case side attachment wall of the side near the aforementioned deleaving member of the aforementioned main part case as it goes to the downstream of the aforementioned feed direction.

[Claim 9] Feed equipment according to claim 4 to 8 characterized by preparing the film member which contacts the form contained in the state of the laminating in the aforementioned covering member.

[Claim 10] the upper surface of each aforementioned form supporter material -- the aforementioned electrode holder -- the feed equipment according to claim 6 to 8 characterized by being formed lower than the upper surface of a member

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## DETAILED DESCRIPTION

## [Detailed Description of the Invention]

[0001]

[The technical field to which invention belongs] this invention is applicable to facsimile apparatus and other various printers, and it relates to the feed equipment which can always feed paper at a time to one sheet of form proper about the feed equipment to which paper is fed, one sheet dissociating at a time through a deleaving member in case paper is fed to two or more sheets of forms contained in the state of the laminating with a feed roller, without being especially influenced by the operating environment.

[0002]

[Description of the Prior Art] While carrying out the support receipt of two or more sheets of forms in the state of a laminating, in case a deleaving pad is arranged in the downstream of the feed direction of a form and a form is conventionally fed to a main part case through a feed roller, various kinds of feed equipments to which paper is fed by collaboration with the frictional force generated between feed operation with a feed roller, and a deleaving pad and the soffit of a form while separating one sheet of form at a time are proposed.

[0003] As this kind of conventional equipment, as shown in drawing 13 (A) and (B), the separation pad P is arranged so that the soffit side of Form H may contact, and there is a sheet separator constituted so that only the form of the most significant might be separated by the frictional force of the separation pad P and soffit side of Form H, for example. In this kind of conventional equipment, the separation pad P is equipped with the lobe PT prepared so that it might project from the long hole section prepared so that it might be prolonged in the direction of a form laminating of the metal electrode-holder member K, and it is constituted so that the lobe PT may always project from the electrode-holder member K in the centrum of the separation pad P, and using elasticity of material. [ arranging foam rubber ]

[0004] While these prevent movement of the whole form with the frictional force produced between a friction member and a form soffit using the friction member which becomes a separation pad from polyurethane etc. Only the form of the most significant is separated.

[0005]

[Problem(s) to be Solved by the Invention] However, although it is common to be formed from resin material, such as polyurethane, as a material of the deleaving pad used for the conventional sheet decollator, a remarkable change produces this kind of resin material in many cases in a physical characteristic by the environmental condition. For example, the flexibility of resin material becomes large and, on the other hand, there is an inclination for the flexibility of resin material to become small under a high-humidity/temperature environment under low-humidity/temperature environment.

[0006] When a deleaving pad is formed from such a resin material, the flexibility of a deleaving pad changes with the operating-environment conditions, and there is a possibility of deforming further. Namely, since it is constituted so that Lobe PT may project from the electrode-holder member K using the elasticity of material, If flexibility changes, it will be overcome by the press force from the form soffit section. Drawing 13 (C), There is a possibility that the whole deleaving pad P may deform as shown in (D). For example, when the degree of hardness of a deleaving pad becomes high in the time of low-humidity/temperature etc., The whole deleaving pad sinks according to the press force from a form soffit side, and over the whole region where Lobe PT is prolonged in the direction's of a form laminating as shown in drawing 13 (C) and (D), since it is the electrode-holder member K, project and bend and, on the whole, it dents to a position. When a form soffit side is no longer contacted with the deleaving pad P and the flexibility of the separation pad P increases under a high-humidity/temperature environment, The deleaving pad of near contacted by the form soffit side sinks one by one. similarly Drawing 13 (C), As shown in (D), are pushed in by the form soffit side to the position whose separation pad P is the electrode-holder member K and which is not a shell projection, and on the whole, the separation pad P is dented as a result. A form soffit side is no longer contacted with the deleaving pad P,

and it has a trouble of normal deleaving becoming impossible.

[0007] While preventing that a deleaving pad deforms this invention, without being made in order to cancel the aforementioned conventional trouble, and being influenced by operating-environment conditions It aims at offering the feed equipment [ it is possible to hold the flexibility of the whole deleaving pad moderately, and ] which can always feed paper to a form proper one sheet at a time, maintaining the balance of the frictional force and the feed force of a feed roller which are generated between the soffit of a form, and a deleaving pad good.

[0008]

[Means for Solving the Problem] The feed equipment applied to a claim 1 in order to attain the aforementioned purpose In the feed equipment which has the deleaving member which collaborates with feed operation of a feed roller and separates one sheet of form in case [ each ] paper is fed to the form contained by the main part case in the state of the laminating with a feed roller The electrode-holder member by which a long hole is formed and, as for the aforementioned deleaving member, is arranged along the direction of a laminating of the aforementioned form at a main part case, the aforementioned electrode holder -- with the separation pad which has the elasticity in which the lobe by which the soffit of a form is contacted, and the skirt-board section which follows a lobe were prepared while being arranged at the member bottom and carrying out specified quantity projection from the aforementioned long hole It is prepared in the aforementioned main part case, and has the pad supporter material which supports the skirt-board section of the aforementioned elastic separation pad from the bottom. the aforementioned skirt-board section the [ used as the lowest edge ] -- the [ a back face-ed / 1 / and / its ] -- the [ which is prepared between a back face-ed / 1 / and the aforementioned lobe ] -- a back face-ed [ 2 ] -- having -- the aforementioned pad supporter material -- the predetermined field of the form conveyance direction downstream of the aforementioned skirt-board section -- receiving -- the -- it is characterized by supporting a back face-ed [ 2 ]

[0009] the pad supporter material prepared in a main part case with the feed equipment of the aforementioned claim 1 - - the predetermined field of the form conveyance direction downstream of the skirt-board section of a separation pad -- receiving -- the -- a back face-ed [ 2 ] is supported, and as a separation pad is not sagged by strengthening a support state, the resistance force to forms is enlarged on the other hand -- the predetermined field of the conveyance direction upstream of the skirt-board section -- receiving -- the -- it is supporting only a back face-ed [ 1 ], a support state is weakened as compared with a downstream, and when a form contacts an elastic separation pad in the state of a laminating, it becomes possible to hold moderate flexibility This sets to the upstream of the form conveyance direction of a separation pad. As a separation pad is sagged suitably, send out the form in a laminating state certainly toward a downstream, and it sets to the downstream of the form conveyance direction of a separation pad. When bending is produced like an upstream, while the form has been in a laminating state, in order to slide in further, in order to prevent this, strengthen the support state of the skirt-board section by pad supporter material, and it is made not to sag a separation pad, and is made to make only one sheet of form separate. That is, \*\* becomes possible about always feeding paper to a form proper one sheet at a time, maintaining the balance of the frictional force and the feed force of a feed roller which are generated between the soffit of a form, and a separation pad good by changing deformation by the form conveyance direction upstream and downstream of a separation pad.

[0010] In addition, as a material which forms an elastic separation pad, polyurethane-resin material is desirable and, as for the degree of hardness, it is desirable that it is in the range of 75 degrees or 85 degrees.

[0011] moreover, the feed equipment concerning a claim 2 -- the feed equipment of a claim 1 -- setting -- the aforementioned pad supporter material -- between the predetermined field of the form conveyance direction downstream of the aforementioned skirt-board section, and the predetermined fields of an upstream -- the [ aforementioned ] -- it is characterized by forming the opening which does not support a back face-ed [ 1 ] Since it may be unable to set by the time it reaches the downstream of a separation pad and moderate bending may be unable to be produced with the feed equipment of this claim 2, when a separation pad is formed from material with a comparatively large degree of hardness, In order to assist this, between the predetermined field of the form conveyance direction downstream of the skirt-board section, and the predetermined field of an upstream the -- the opening which is not supported about a back face-ed [ 1 ], either is formed in pad supporter material, and it becomes possible by making bending easy to produce also about material with a large degree of hardness to always feed paper to a form proper one sheet at a time

[0012] Furthermore, the feed equipment concerning a claim 3 is characterized by forming minute irregularity in the upper surface of the aforementioned lobe in a claim 1 or the feed equipment of 2. The minute irregularity formed in this lobe has the operation which improves the frictional force generated between the soffits of a form, and becomes possible [ that this separates one sheet of form at a time certainly ].

[0013] furthermore, in a claim 1 or the feed equipment of 3, the covering member in which the bending section which counters the form contained by the aforementioned main part case was prepared arranges the feed equipment

concerning a claim 4 -- having -- \*\*\*\* -- the aforementioned covering -- the bending section of a member is characterized by regulating so that a laminating state may be held in contact with a form thus, covering -- it enables them for two or more sheets of forms to prevent rushing in simultaneously into feed equipment, and to prevent \*\*\*\* of a form certainly by making the form of a laminating state contact through the bending section of a member, and regulating

[0014] Moreover, the center of the aforementioned feed roller and the center of the aforementioned elastic separation pad are characterized by estranging only predetermined distance along the cross direction of the aforementioned form in a claim 1 or one feed equipment of 4, as for the feed equipment concerning a claim 5. Since it will be experientially known that it will be easy to generate \*\*\*\* of a form if predetermined distance is too short, the balance of the feed force with a feed roller and the regulation force of a form with an elastic separation pad is taken [ if predetermined distance is too long, it will be easy to generate \*\*\*\* of a form, and ] into consideration here with the feed equipment of a claim 4 on the other hand and predetermined distance is set as it, it becomes possible to prevent \*\*\*\* of a form, and \*\*\*\*

[0015] furthermore, the feed equipment concerning a claim 6 -- a claim 1 or one feed equipment of 5 -- setting -- the aforementioned main part case -- the aforementioned deleaving -- form supporter material prepares on both sides of a member -- having -- \*\*\*\* -- the aforementioned deleaving -- the electrode holder of a member -- the apical surface of a member and each form supporter material is characterized by being mutually constituted flat-tapped in the downstream of the feed direction of a form the feed equipment of a claim 5 -- a electrode holder -- since the apical surface of a member and each form supporter material is mutually constituted flat-tapped in the downstream of the feed direction of a form, a form will be supported crosswise [ the ] in three positions on the same line at the time of feeding, and it becomes possible to prevent the skew of a form from this

[0016] Moreover, in the feed equipment of a claim 6, the feed equipment concerning a claim 7 is characterized by preparing the ramp which becomes low in \*\*\*\* at each aforementioned form supporter material as it goes to the downstream of the aforementioned feed direction. Thus, if constituted, the nose of cam of a form will be smoothly shown in the feed direction through a ramp, and the nose of cam of a form will be that prevent curling to an opposite direction and the feed direction can prevent jamming.

[0017] Furthermore, in a claim 1 or one feed equipment of 7, the feed equipment concerning a claim 8 is characterized by preparing the guidance rib which has the ramp which becomes low in \*\*\*\* at the aforementioned main part case as it goes to the downstream of the aforementioned feed direction. With this feed equipment, since the nose of cam of a form is shown in the feed direction through the ramp of a guidance rib at the time of feeding, the nose of cam of a form is that prevent curling to an opposite direction and the feed direction can prevent jamming.

[0018] Moreover, the feed equipment concerning a claim 9 is characterized by preparing the film member which contacts the form contained in the state of the laminating in the aforementioned covering member in a claim 4 or one feed equipment of 8. With this feed equipment, since a film member regulates in contact with a form so that the nose of cam of a form may ride on an elastic separation pad, when the point of a form has curled to the feed direction and the opposite direction, it becomes possible to prevent \*\*\*\* of a form certainly.

[0019] furthermore, the feed equipment concerning a claim 10 -- a claim 6 or one feed equipment of 8 -- setting -- the upper surface of each aforementioned form supporter material -- the aforementioned electrode holder -- it is characterized by being formed lower than the upper surface of a member this feed equipment -- the upper surface of each form supporter material -- a electrode holder -- the case where the point of a form has curled since it is formed lower than the upper surface of a member -- also setting -- the nose of cam of a form -- a electrode holder -- it will be certainly contacted to the lobe of the elastic separation pad which projects from the long hole of a member, and can separate one sheet of form at a time from this certainly

[0020]

[Embodiments of the Invention] It explains in detail, referring to a drawing about the feed equipment concerning this invention hereafter based on the operation form which materialized this invention. First, the whole feed equipment composition concerning this operation form is explained based on drawing 1 or drawing 3 . It is the \*\* type front view in which being able to shift the angle of the \*\* type front view drawing 1's showing the \*\* type front view of feed equipment, and drawing 2 here, and showing the \*\* type plan of feed equipment, and drawing 3 in drawing 1 , and showing it.

[0021] In drawing 1 or drawing 3 , feed equipment 1 has the main part case 2, and the main part case 2 is equipped with the bottom wall 3 and the inclination wall 4 formed in one so that an obtuse angle might be made from the bottom wall 3 (refer to drawing 9 ). When a bottom wall 3 and the inclination wall 4 constitute the form stacker which carries out a stack here where the laminating of the form is carried out, and the stack of the form is carried out in the state of a laminating, while the soffit of a form is contacted at a bottom wall 3, the rear-face side of a form is supported by the



inclination wall 4.

[0022] The feed roller shaft 6 is constructed across between the side attachment wall 5 of the couple formed in the both sides of the main part case 2, and 5. The roller gear 8 which meshes to the drive 7 fixed to the side attachment wall 5 has fixed in the edge (the drawing 1 Nakamigi side edge section) of this feed roller shaft 6, and the roller supporter material 9 is attached in it possible [ rotation ] at the abbreviation mid gear of the feed roller shaft 6. The feed roller 10 which the gear train (not shown) which transmits rotation of the feed roller shaft 6 is arranged in this roller supporter material 9, and rotates through this gear train is supported possible [ rotation ]. In addition, the roller supporter material 9 is energized through the energization spring 11 at the form side.

[0023] When feeding paper to the form in the inner best position of the form contained by the bottom wall 3 and the inclination wall 4 in the state of the laminating, the rotation drive of the feed roller shaft 6 is carried out through a drive 7 and the roller gear 8, and the rotation drive of the feed roller 10 is carried out by the gear train in the roller supporter material 9 based on this. Thereby, paper is fed in the feed direction to a form through the feed roller 10 by which a rotation drive is carried out.

[0024] the position which shifted from the center of a feed roller to the bottom wall 3 of the main part case 2 a little on left-hand side -- delevaing -- a member 12 arranges -- having -- \*\*\*\* -- moreover, delevaing -- a position unsymmetrical on both sides of a member 12 -- a form support -- the member 13 is arranged

[0025] here -- delevaing -- the composition of a member 12 is explained based on drawing 4 , drawing 6 , and drawing 7 drawing 4 -- delevaing -- it is the type section view of a member 12, and a B-B line cross section [ in / drawing 1 / in drawing 4 (A) ] and drawing 4 (B) are the B1-B1 line cross sections in drawing 4 (A) Explanatory drawing in which drawing 6 shows a electrode-holder member, and drawing 7 are explanatory drawings showing an elastic separation pad.

[0026] these drawings -- setting -- delevaing -- a member 12, while press working of sheet metal is fundamentally carried out from SUS sheet metal so that it may become convex by \*\*\*\*\* the electrode holder holding the elastic separation pad 15 -- a member 14 and a electrode holder -- the pad supporter material 16 which is formed in the bottom wall 3 of the separation pad 15 and the main part case 2 which is arranged at the member 14 bottom, is formed from resin material, such as polyurethane, and has elasticity, and supports the separation pad 15 from the bottom -- and a electrode holder -- it consists of attachment components 17 made from a polyacetal held where the member 14 and the end of the separation pad 15 were inserted and both are unified

[0027] a electrode holder -- as shown in drawing 4 (B) and drawing 6 (A), the member 14 is formed in the convex configuration by \*\*\*\*\*, and has horizontally stop section 14C by which bending formation was carried out from side-attachment-wall section 14B which follows a lower part from the both sides of level-like upper wall section 14A and upper wall section 14A, and each side-attachment-wall section 14B moreover, a electrode holder -- a member 14 has predetermined length in the direction of a laminating of a form (refer to drawing 10 and drawing 11 ) As shown in drawing 6 (B), long hole 14D is formed in upper wall section 14A along the direction of a laminating of a form. This long hole 14D exposes lobe 15D formed in the separation pad 15 to the up side. Tooling-holes 14E is formed in the edge (left-hand side edge in drawing 6 (B)) of long hole 14D, and locating-lug 17A formed in the inner upper wall of an attachment component 17 fits into these tooling-holes 14E. thereby -- a electrode holder -- positioning fixation with a member 14 and an attachment component 17 is performed

[0028] moreover, a electrode holder -- each stop section 14C of a member 14 -- a top -- projection -- height 14F form the bottom -- having -- \*\*\*\* -- each -- height 14F are contacted at the rear-face side of the fixed piece 18 (refer to drawing 4 (B)) formed in the main part case 2 and one on both sides of the pad supporter material 16 this -- a electrode holder -- while the soffit section is contacted to a member 14 in the level difference section of the pad supporter material 16 -- each -- height 14F contact the rear-face side of the fixed piece 18 through the elastic force of stop section 14C -- having -- consequently, a electrode holder -- a member 14 is fixed to the main part case 2

[0029] furthermore, a electrode holder -- it is shown in drawing 6 (C) at one side-attachment-wall section 14B of a member 14 -- as -- a lower part -- opening -- stop slot 14G are formed the bottom the piece of a stop by which these stop slot 14G are formed in the separation pad 15 -- 15F -- stopping -- a electrode holder -- the operation which positions a member 14 and the separation pad 15 mutually is performed

[0030] the separation pad 15 is formed from resin material, such as polyurethane which has the comparatively large degree of hardness of the range of 75 degrees or 85 degrees, and is shown in drawing 7 (A) -- as -- a electrode holder -- it has the end-face configuration of the convex configuration which carries out abbreviation agreement in the end-face configuration of a member 14 this separation pad 15 is shown in drawing 4 (A) and (B) -- as -- a electrode holder -- it is arranged at the member 14 bottom and consists of skirt-board section 15B which extended in the lower part from the both sides of level-like upper wall section 15A and upper wall section 15A fundamentally moreover, the separation pad 15 -- the aforementioned electrode holder -- it has predetermined length like a member 14 in the direction of a

laminating of a form (refer to drawing 10 and drawing 11 ) Protruding lines 15C and 15C are formed in the edges on both sides of upper wall section 15A, and lobe 15D formed more highly than protruding line 15C is prepared between each protruding line 15C. the height of this lobe 15D -- a electrode holder -- it is set up so that specified quantity projection may be carried out from long hole 14D of a member 14, and the soffit of a form is directly contacted by lobe 15D in the state where it was contained in the state of the laminating Internal-surface 15 B-2 which skirt-board section 15B has the vertical section which was crooked from the horizontal level and horizontal level which continue from upper wall section 15A, and extended below, and consists of a horizontal level and a vertical section As shown in drawing 4 (A) and (B), in the predetermined field of the form conveyance direction downstream, the undersurface 15B1 which is contacted in the state of the level difference section of the pad supporter material 16 and adhesion, and serves as the lowest edge of the separation pad 15 is also contacted by the level difference lower part of the pad supporter material 16. Thereby, the separation pad 15 is firmly supported by the pad supporter material 16.

[0031] therefore, it is shown in drawing 12 (A) -- as -- usually -- lobe 15D -- an electrode holder -- it succeeds in separation of normal feeding, without the form after the 2nd sheet resisting the feed force with the feed roller 10 from the most significant with the frictional force generated between a form soffit side and lobe 15D, and being transported with the 1st form, since it projects from a member 14 and the form soffit side is contacted with the lobe Moreover, when the degree of hardness of the whole separation pad falls or increases under the environment of high-humidity/temperature or low-humidity/temperature, it also sets. Since the aforementioned pad supporter material is firmly supported in the form conveyance direction downstream of a separation pad and lobe 15D is not dented in the form conveyance direction downstream as shown in drawing 12 (B) The form soffit side after the 2nd sheet will be contacted with lobe 15D of the form conveyance direction down-stream position from the most significant, and it succeeds in separation of normal feeding.

[0032] Furthermore, as shown in drawing 7 (B), minute irregularity 15E is formed in the upper surface of lobe 15D. This minute irregularity 15E performs the operation which enlarges frictional force generated between the soffits of a form, and one sheet of form is certainly separated at a time based on the balance of the operation by this minute irregularity 15E, and the feed force with the aforementioned feed roller 10.

[0033] moreover, while shows the separation pad 15 to drawing 7 (B) and (C) from the side of skirt-board section 15B -- as -- the piece of a stop -- 15F form -- having -- \*\*\*\* -- this piece of a stop -- the electrode holder which 15F described above -- it is stopped by stop slot 14G of a member 14 such a piece of a stop -- the stop relation between 15F and stop slot 14G -- being based -- the separation pad 15 and a electrode holder -- a member 14 is positioned mutually

[0034] The pad supporter material 16 has two supporters 16A and 16B which have the shape of a cuspidate up along with the longitudinal direction of the separation pad 15, as shown in drawing 4 (A). Supporter 16A in the form conveyance direction downstream is supporting the both sides of the inferior surface of tongue 15B1 used as the lowest edge of the separation pad 15, and inferior-surface-of-tongue 15 B-2. Moreover, supporter 16B in the form conveyance direction upstream is supporting only the inferior surface of tongue 15B1 of the separation pad 15. At this time, opening 16C will be formed between each supporters 16A and 16B of the pad supporter material 16 and the inferior surfaces of tongue 15B1 of skirt-board section 15B which are supporting the upstream and downstream of the separation pad 15. This opening 16C performs the operation which makes moderate flexibility hold to the whole separation pad 15, when it forms from resin material with a big degree of hardness so that the physical characteristic of the separation pad 15 may not be influenced by the operating environment and a form is contacted on the separation pad 15 in the state of a laminating. Thus, one sheet of form is separable at a time proper, maintaining the balance of the frictional force generated between the soffit of a form, and the separation pad 15 from a bird clapper as it is possible to give moderate flexibility to the separation pad 15 based on existence of opening 16C, and the feed force with the feed roller 10 good. In addition, you may be the configuration in which opening 16C is not formed in depending on the quality of the material of the separation pad 15, but the pad supporter material 16 supports the inferior surface of tongue 15B1 of skirt-board section 15B over an overall length.

[0035] an attachment component 17 -- a electrode holder -- it has locating-lug 17A which fits into tooling-holes 14E formed in the edge of long hole 14D of a member 14 in an inner upper wall this locating-lug 17A -- the stop relation between piece of stop 15E, and stop slot 14G -- being based -- the separation pad 15 and a electrode holder -- the state which unified the member 14 -- it is -- a electrode holder -- it fits into tooling-holes 14E of a member 14 -- having -- thereby -- an attachment component 17 -- the separation pad 15 and a electrode holder -- a member 14 is held to one

[0036] delevaing constituted as mentioned above -- as it is indicated in drawing 1 as the center of the separation pad 15 and the center of the aforementioned feed roller 10 which are arranged by the member 12, only the predetermined distance P is estranged along the cross direction of a form If Distance P is too long, it will be easy to generate \*\*\*\* of a form, and on the other hand, if Distance P is too short here, generally it will be known that it will be easy to generate \*\*\*\* of a form, here this situation will be taken into consideration, and Distance P will be set as it. With this operation

form, it became possible by taking into consideration the balance of the feed force with the feed roller 10, and the regulation force of a form with the separation pad 15, and setting Distance P as about 20mm to prevent \*\*\*\* and \*\*\*\* of a form.

[0037] Moreover, on the outside [ support / form / 13 (form support 13 of the left-hand side in drawing 1 ) / one ], it crosses as the bottom wall 3 and the inclination wall 4 of the main part case 2, and the triangle-like guidance rib 19 is formed (refer to drawing 1 , drawing 3 , and drawing 9 ). This guidance rib 19 has ramp 19A which becomes low gradually as it goes to the downstream ( drawing 1 Nakashita side) of the feed direction of a form. Since the nose of cam of a form is shown in the feed direction through ramp 19A of the guidance rib 19 at the time of feeding, it is prevented that the nose of cam of a form curls to an opposite direction with the feed direction, and, thereby, it can prevent the jamming of a form.

[0038] next, said deleaving -- the composition of the form support 13 currently arranged in the bottom wall 3 on both sides of a member 12 is explained based on drawing 5 and drawing 8 Drawing 5 is the type section view of the form support 13 here, and an A-A line cross section [ in / drawing 1 / in drawing 5 (A) ] and drawing 5 (B) are the A1-A1 line cross sections in drawing 5 (A). Drawing 8 is explanatory drawing showing a form support member.

[0039] the form support formed in one from resin material in drawing 5 and drawing 8 so that the form support 13 might serve as convex by \*\*\*\*\* fundamentally -- it is constituted by arranging a member 20 in the support section 21 formed in the bottom wall 3 of the main part case 2

[0040] here -- a form support -- the member 20 consists of stop section 20C horizontally installed from side-attachment-wall section 20B which hung continuously from the both sides of level-like upper wall section 20A and upper wall section 20A, and each side-attachment-wall section 20B fundamentally, as shown in drawing 5 (A) and (B) As shown in drawing 8 (B) and (C), each stop section 20C is horizontally installed from two places of each side-attachment-wall section 20B, and is contacted at the rear-face side of the fixed piece 22 (refer to drawing 5 (B)) formed in the level difference section formed in holddown-member 21A of the support section 21, and the main part case 2 at one. this -- a form support -- a member 20 contacts the rear-face side of the fixed piece 22 while the stop section 20C is contacted in the level difference section of holddown-member 21A -- having -- consequently, a support -- a member 20 is fixed to the support section 21 of the main part case 2

[0041] Moreover, from upper wall section 20A, ramp 20D which becomes low gradually is prepared as it goes to a downstream ( drawing 5 (A) Nakamigi side) along the feed direction of a form. This ramp 20D performs the operation which prevents that show the nose of cam of a form in the feed direction smoothly, and the nose of cam of a form curls in the direction contrary to the feed direction. Thereby, the jamming of a form can be prevented.

[0042] the form support arranged in each form support 13 constituted as mentioned above -- the apical surface of a member 20, and the aforementioned deleaving -- the electrode holder in a member 12 -- the apical surface of a member 14 is made flat-tapped to mutual at the downstream of the feed direction of a form, as a dashed line L shows in drawing 2 thus, a form support -- the apical surface of a member 20, and a electrode holder -- the apical surface of a member 14 -- mutual -- it can prevent certainly that a form will be supported crosswise [ the ] in three positions on the same line, and a form carries out a skew from this at the time of feeding by constituting flat-tapped

[0043] moreover, the form support in each form support 13 -- an alternate long and short dash line M shows the upper surface of a member 20 in drawing 3 -- as -- deleaving -- the electrode holder in a member 12 -- it is formed lower than the upper surface of a member 14 the case where the nose of cam of a form has curled based on this -- also setting -- the nose of cam of a form -- a electrode holder -- it will be certainly contacted to lobe 15D of the separation pad 15 which projects from long hole 14D of a member 14, therefore can separate one sheet of form at a time certainly

[0044] the feed equipment 1 of this operation form is shown in the opposite side of the main part case 2 at drawing 9 and drawing 10 which are the type section view of feed equipment 1 -- as -- covering -- a member 30 arranges -- having -- \*\*\*\* -- this covering -- a receipt \*\*\*\* form is countered in the state of a laminating over a bottom wall 3 and the inclination wall 4, and the bending section 31 is formed in the member 30 This bending section 31 contacts the form of the best position, and it is regulated so that the laminating state of a form may be held. thus, covering -- it enables them for two or more sheets of forms to be able to prevent rushing in simultaneously into feed equipment 1, and to prevent \*\*\*\* of a form certainly from this by making the bending section 31 of a member 30 contact the form of a laminating state, and regulating it

[0045] moreover, covering -- the film which has elasticity as shown in drawing 10 and drawing 11 near the bending section 31 of a member 30 -- the member 32 is attached this film -- the form H of the best position where the member 32 was contained in the state of the laminating -- contacting -- the nose of cam of Form H -- deleaving -- a regulation operation is performed so that it may ride on lobe 15D of the separation pad 15 in a member 12 When the point of Form H has curled in the direction contrary to the feed direction by this, \*\*\*\* of a form can be prevented certainly.

[0046] in addition, it is shown in drawing 10 and drawing 11 -- as -- a film -- it follows flexibly and a member 32 can



contact the form H of the best position, even if the amount of stacks of Form H fluctuates, since it has elasticity  
Drawing 10 and drawing 11 are the type section views showing feed equipment 1 partially.

[0047] With the feed equipment 1 applied to this operation form as explained to the detail above, as the pad supporter material 16 prepared in the main part case 2 supports both the two undersurfaces 15B1 and 15 B-2 and does not sag the separation pad 15 by strengthening a support state to the predetermined field of the form conveyance direction downstream of skirt-board section 15B of the separation pad 15, it enlarges the resistance force to forms. On the other hand, to the predetermined field of the conveyance direction upstream of skirt-board section 15B, it is supporting only the one undersurface 15B1, a support state is weakened as compared with a downstream, and when a form contacts the elastic separation pad 15 in the state of a laminating, it becomes possible to hold moderate flexibility. This sets to the upstream of the form conveyance direction of the separation pad 15. As the separation pad 15 is sagged suitably, send out the form in a laminating state certainly toward a downstream, and it sets to the downstream of the form conveyance direction of the separation pad 15. When bending is produced like an upstream, while the form has been in a laminating state, in order to slide in further, in order to prevent this, strengthen the support state of skirt-board section 15B by the pad supporter material 16, and it is made not to sag the separation pad 15, and is made to make only one sheet of form separate. That is, \*\* becomes possible about always feeding paper to a form proper one sheet at a time, maintaining the balance of the frictional force and the feed force of the feed roller 10 which are generated between the soffit of a form, and the separation pad 15 good by changing deformation by the form conveyance direction upstream and downstream of the separation pad 15.

[0048] Moreover, minute irregularity 15E which minute irregularity 15E is formed in the upper surface of lobe 15D of the separation pad 15, and was formed in this lobe 15D has the operation which improves the frictional force generated between the soffits of a form, and becomes possible [ separating one sheet of form at a time from this certainly ].

[0049] furthermore, covering with which the bending section 31 which counters the form contained by the main part case 2 was formed -- a member 30 arranges -- having -- \*\*\*\* -- covering -- since the bending section 31 of a member 30 is regulated so that a laminating state may be held in contact with a form, it becomes able [ forms ] for two or more sheets of forms to prevent rushing in simultaneously into feed equipment 1, and to prevent \*\*\*\* of a form certainly

[0050] Moreover, since only the predetermined distance P is estranged, the center of the aforementioned feed roller 10 and the center of the separation pad 15 take into consideration the balance of the feed force according [ this predetermined distance P ] to the feed roller 10, and the regulation force of a form with the separation pad 15 along the cross direction of a form and it is set up, it becomes possible to prevent \*\*\*\* of a form, and \*\*\*\*.

[0051] The form support 13 is formed on both sides of a member 12. furthermore -- the main part case 2 -- delevaing -- delevaing -- the electrode holder of a member 12 -- the form support of a member 14 and each form support 13 -- a member -- 20 apical surface Since it is mutually constituted flat-tapped in the downstream of the feed direction of a form, a form will be supported crosswise [ the ] in three positions on the same line at the time of feeding, and it becomes possible to prevent the skew of a form from this.

[0052] moreover, the form support in each form support 13 -- since ramp 20D which goes to the downstream of the feed direction and which is alike, follows and becomes low at \*\*\*\* is prepared in the member 20, the nose of cam of a form is smoothly shown in the feed direction through ramp 20D, and the nose of cam of a form is that prevent curling to an opposite direction and the feed direction can prevent jamming

[0053] Furthermore, since the guidance rib 19 which has ramp 19A which becomes low is formed in \*\*\*\* as it goes for the downstream of the feed direction to the main part case 2, the nose of cam of a form will be shown in the feed direction through ramp 19A of the guidance rib 19 at the time of feeding, and the nose of cam of a form is that prevent curling to an opposite direction and the feed direction can prevent jamming.

[0054] moreover, covering -- the film which contacts the form contained by the member 30 in the state of the laminating -- a member 32 prepares -- having -- \*\*\*\* -- a film -- since a member 32 regulates in contact with a form so that the nose of cam of a form may ride on the separation pad 15, when the point of a form has curled to the feed direction and the opposite direction, it becomes possible to prevent \*\*\*\* of a form certainly

[0055] furthermore, the form support in each form support 13 -- the upper surface of a member 12 -- a electrode holder -- the case where the point of a form has curled since it is formed lower than the upper surface of a member 14 -- also setting -- the nose of cam of a form -- a electrode holder -- it will be certainly contacted to lobe 15D of the separation pad 15 which projects from long hole 14D of a member 14, and can separate one sheet of form at a time from this certainly

[0056] In addition, of course, improvement various by within the limits which this operation form does not limit this invention and does not deviate from the summary of this invention and deformation are possible.

[0057]

[Effect of the Invention] the pad supporter material prepared in a main part case with the feed equipment applied to a

claim 1 as explained above -- the predetermined field of the form conveyance direction downstream of the skirt-board section of a separation pad -- receiving -- the -- the [ a back face-ed / 1 / and ] -- both back faces-ed [ 2 ] are supported, and as a separation pad is not sagged by strengthening a support state, the resistance force to forms is enlarged on the other hand -- the predetermined field of the conveyance direction upstream of the skirt-board section -- receiving -- the -- it is supporting only a back face-ed [ 1 ], a support state is weakened as compared with a downstream, and when a form contacts an elastic separation pad in the state of a laminating, it becomes possible to hold moderate flexibility This sets to the upstream of the form conveyance direction of a separation pad. As a separation pad is sagged suitably, send out the form in a laminating state certainly toward a downstream, and it sets to the downstream of the form conveyance direction of a separation pad. When bending is produced like an upstream, while the form has been in a laminating state, in order to slide in further, in order to prevent this, strengthen the support state of the skirt-board section by pad supporter material, and it is made not to sag a separation pad, and is made to make only one sheet of form separate. That is, \*\* becomes possible about always feeding paper to a form proper one sheet at a time, maintaining the balance of the frictional force and the feed force of a feed roller which are generated between the soffit of a form, and a separation pad good by changing deformation by the form conveyance direction upstream and downstream of a separation pad.

[0058] Moreover, since it may be unable to set by the time it reaches the downstream of a separation pad and moderate bending may be unable to be produced with the feed equipment of a claim 2, when a separation pad is comparatively formed from a large material of a high degree of hardness, In order to assist this, between the predetermined field of the form conveyance direction downstream of the skirt-board section, and the predetermined field of an upstream the -- the opening which is not supported about a back face-ed [ 1 ], either is formed in pad supporter material, and it becomes possible by making bending easy to produce also about material with a large degree of hardness to always feed paper to a form proper one sheet at a time

[0059] Moreover, with the feed equipment concerning a claim 3, since there is minute irregularity formed in the lobe about the operation which improves the frictional force generated between the soffits of a form, it becomes possible [ separating one sheet of form at a time certainly ].

[0060] furthermore -- the feed equipment concerning a claim 4 -- covering -- it enables them for two or more sheets of forms to prevent rushing in simultaneously into feed equipment, and to prevent \*\*\*\* of a form certainly by making the form of a laminating state contact through the bending section of a member, and regulating

[0061] Moreover, with the feed equipment concerning a claim 5, since the balance of the feed force with a feed roller and the regulation force of a form with an elastic separation pad is taken into consideration and predetermined distance is set up, it becomes possible to prevent \*\*\*\* of a form, and \*\*\*\*.

[0062] furthermore -- the feed equipment concerning a claim 6 -- a electrode holder -- since the apical surface of a member and each form supporter material is mutually constituted flat-tapped in the downstream of the feed direction of a form, a form will be supported crosswise [ the ] in three positions on the same line at the time of feeding, and it becomes possible to prevent the skew of a form from this

[0063] Moreover, with the feed equipment concerning a claim 7, the nose of cam of a form is smoothly shown in the feed direction through a ramp, and the nose of cam of a form is that prevent curling to an opposite direction and the feed direction can prevent jamming.

[0064] Furthermore, with the feed equipment concerning a claim 8, since the nose of cam of a form is shown in the feed direction through the ramp of a guidance rib at the time of feeding, the nose of cam of a form is that prevent curling to an opposite direction and the feed direction can prevent jamming.

[0065] Moreover, with the feed equipment concerning a claim 9, since a film member regulates in contact with a form so that the nose of cam of a form may ride on an elastic separation pad, when the point of a form has curled to the feed direction and the opposite direction, it becomes possible to prevent \*\*\*\* of a form certainly.

[0066] furthermore -- the feed equipment concerning a claim 10 -- the upper surface of each form supporter material -- a electrode holder -- the case where the point of a form has curled since it is formed lower than the upper surface of a member -- also setting -- the nose of cam of a form -- a electrode holder -- it will be certainly contacted to the lobe of the elastic separation pad which projects from the long hole of a member, and can separate one sheet of form at a time from this certainly

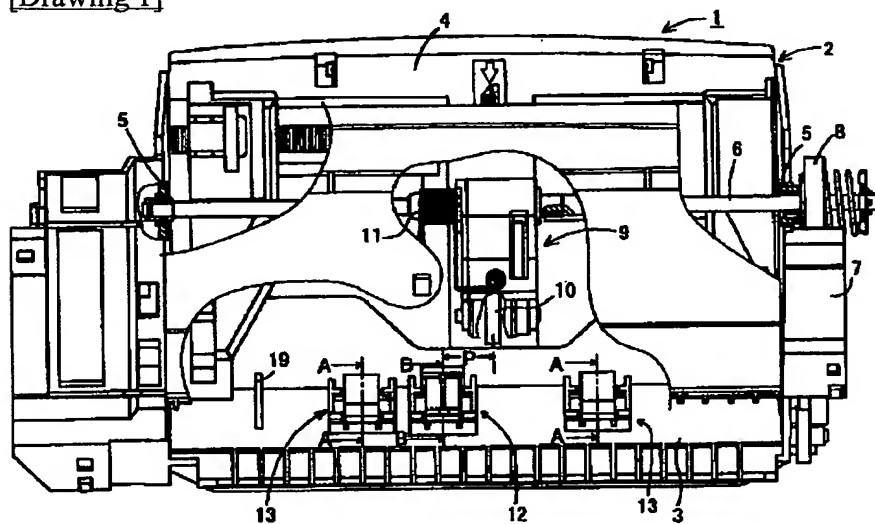
## \* NOTICES \*

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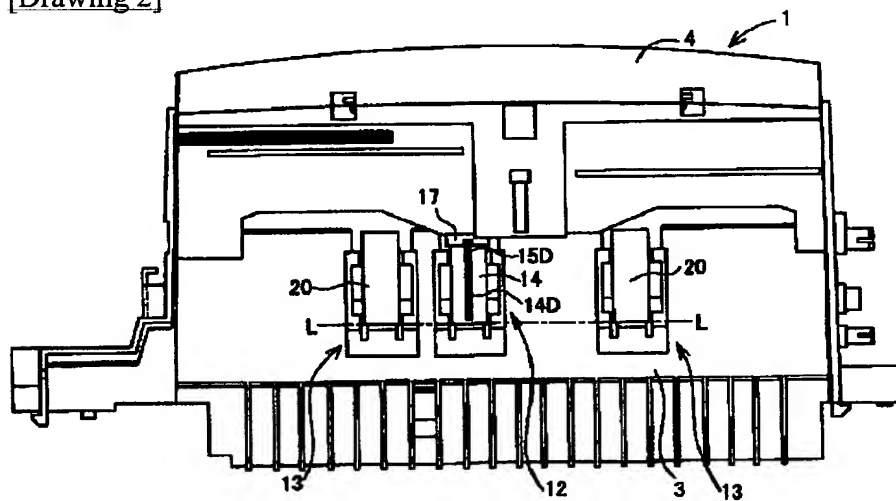
1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. \*\*\*\* shows the word which can not be translated.
3. In the drawings, any words are not translated.

## DRAWINGS

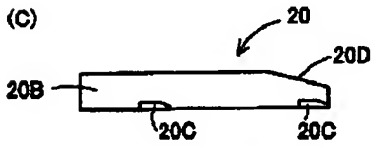
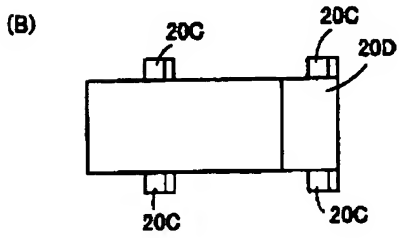
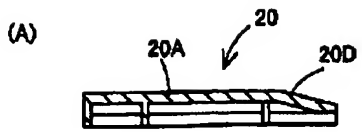
[Drawing 1]



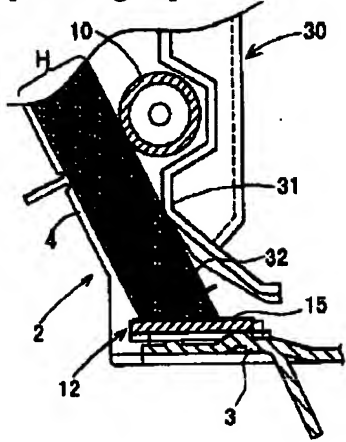
[Drawing 2]



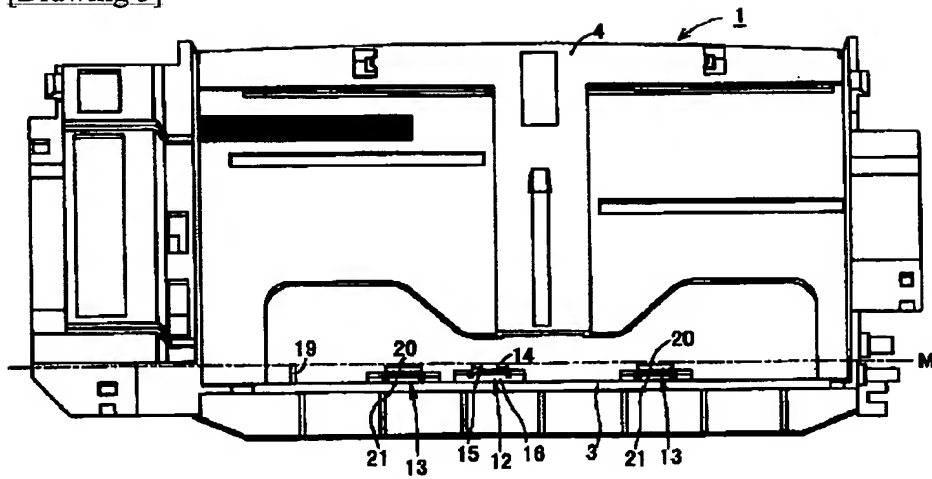
[Drawing 8]



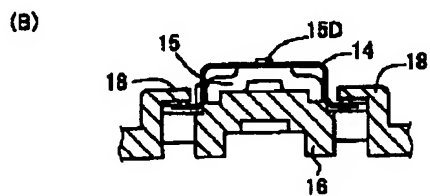
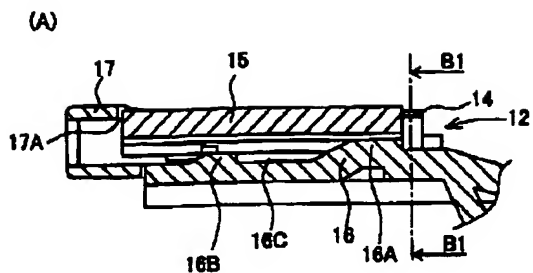
[Drawing 10]



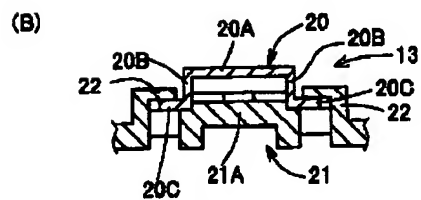
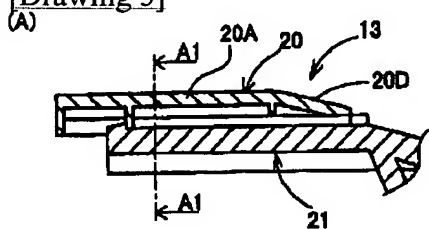
[Drawing 3]



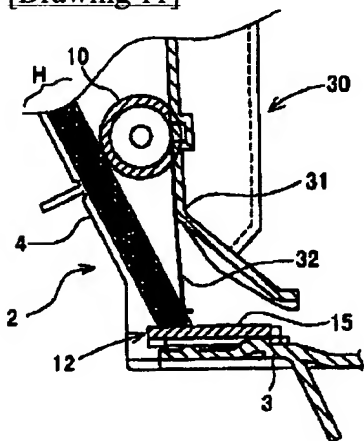
[Drawing 4]



[Drawing 5]

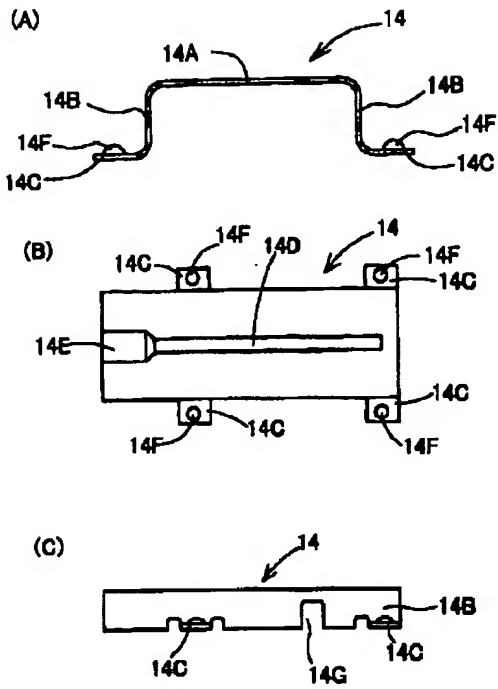


[Drawing 11]

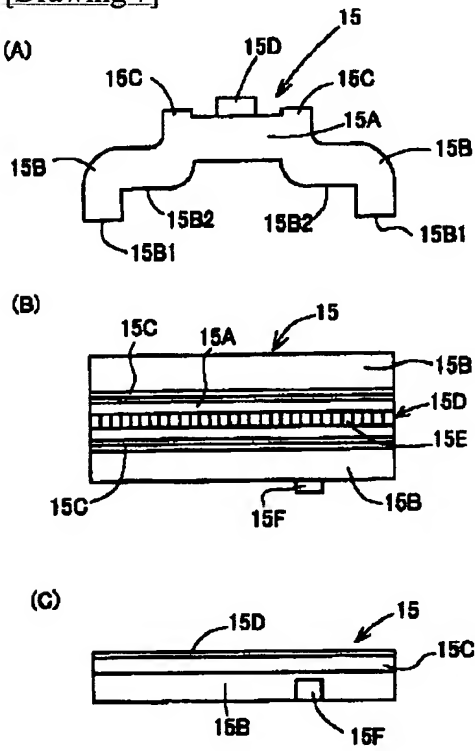


[Drawing 6]

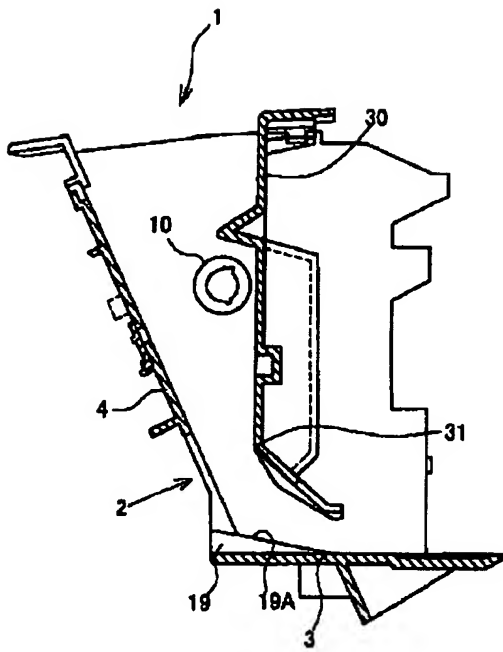




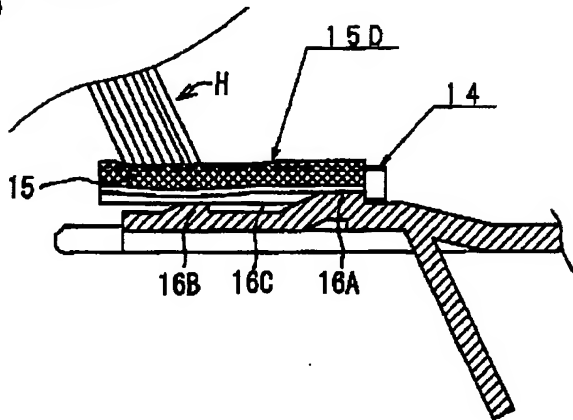
[Drawing 7]



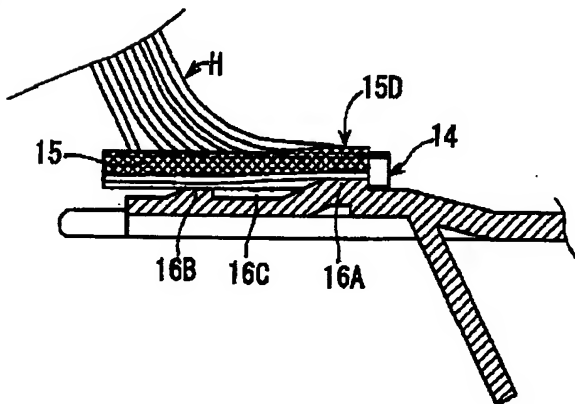
[Drawing 9]



[Drawing 12]  
(A)

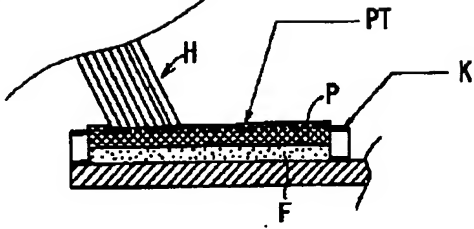


(B)

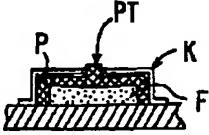


[Drawing 13]

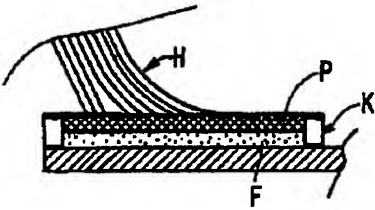
(A)



(B)



(C)



(D)



[Translation done.]